

CLAIMS

What is claimed is:

1. A method for performing a pattern match search for a data string having a plurality of characters separated by delimiters, said method comprising:
2. defining a first category of characters as delimiters such that all remaining characters are defined as non-delimiters;
3. constructing a search key by:
4. generating a full match search increment comprising the binary representation of a data string element, wherein said data string element comprises all non-delimiters between a pair of said delimiters; and
5. concatenating a pattern search prefix to said full match search increment to form said search key, wherein said pattern search prefix is a cumulative pattern search result of each previous full match search increment;
6. performing a full match search within a lookup table utilizing said search key;
7. in response to finding a matching pattern within said lookup table, returning to said step of constructing a search key; and
8. in response to not finding a matching pattern, utilizing the previous full match search result to process said data string.
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- 1 2. The method of claim 1, wherein said step of constructing a search key is
2 preceded by pointing to a character within said data string.
- 1 3. The method of claim 2, wherein said step of constructing a search key further
2 comprises:
3 evaluating said character to determine whether or not said character is a
4 delimiter;
5 in response to said character being a delimiter:
6 delivering a full match search increment into a search key register, wherein
7 said search increment comprises a binary representation of all non-delimiters between
8 said delimiter and an immediately preceding delimiter; and
9 concatenating said pattern search prefix to said search increment within said
10 search key element;
11 in response to said character not being a delimiter, appending a binary
12 representation of said character to said search increment; and
13 incrementing said pointer.
- 1 4. The method of claim 1, further comprising in response to finding a matching
2 pattern, updating said pattern search prefix.
- 1 5. The method of claim 1, wherein said step of performing a full match search
2 further comprises:

3 determining whether or not a full match for said search key exists within said
4 hash table by:

5 hashing said search key to produce a hash key result;

6 indexing a hash table utilizing said hash key result to find a matching stored
7 pattern; and

8 resolving collisions in said hash table utilizing a pattern search control block.

6. The method of claim 1, wherein said data string is a Universal Resource
Indicator address, and wherein said data string element is a URI element.

7. The method of claim 6, wherein said delimiters comprise period characters or
slash characters.

8. The method of claim 6, wherein said step of constructing a search key is
preceded by the steps of:

3 scanning an IP data packet to determine a first URI element to be parsed;

4 initializing a URI pointer to a first character within said first URI element; and

5 initializing said pattern search prefix to zero.

1 9. A system for performing a pattern match search for a data string having a
2 plurality of characters separated by delimiters, said system comprising:

3 means for defining a first category of characters as delimiters such that all
4 remaining characters are defined as non-delimiters;

5 processing means for constructing a search key by:

6 generating a full match search increment comprising the binary representation
7 of a data string element, wherein said data string element comprises all non-delimiters
8 between a pair of said delimiters; and

9 concatenating a pattern search prefix to said full match search increment to
10 form said search key, wherein said pattern search prefix is a cumulative pattern search
11 result of each previous full match search increment;

12 processing means for performing a full match search within a lookup table
13 utilizing said search key;

14 processing means response to finding a matching pattern within said lookup
15 table for returning to said step of constructing a search key; and

16 processing means responsive to not finding a matching pattern for utilizing the
17 previous full match search result to process said data string.

1 10. The system of claim 9, further comprising processing means for pointing to a
2 character within said data string prior to constructing a search key.

1 11. The system of claim 10, wherein said processing means for constructing a
2 search key further comprises:

3 processing means for evaluating said character to determine whether or not
4 said character is a delimiter;

5 processing means responsive to said character being a delimiter for:

6 delivering a full match search increment into a search key register, wherein
7 said search increment comprises a binary representation of all non-delimiters between
8 said delimiter and an immediately preceding delimiter; and

9 concatenating said pattern search prefix to said search increment within said
10 search key element;

11 processing means responsive to said character not being a delimiter for
12 appending a binary representation of said character to said search increment; and

13 processing means for incrementing said pointer.

1 12. The system of claim 9, further comprising processing means responsive to
2 finding a matching pattern for updating said pattern search prefix.

1 13. The system of claim 9, wherein said processing means for performing a full
2 match search further comprises:

3 processing means for determining whether or not a full match for said search
4 key exists within said hash table by:

5 hashing said search key to produce a hash key result;

6 indexing a hash table utilizing said hash key result to find a matching stored
7 pattern; and

8 resolving collisions in said hash table utilizing a pattern search control block.

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14. The system of claim 9, wherein said data string is a Universal Resource
2 Indicator address, and wherein said data string element is a URI element.

15. The system of claim 14, wherein said delimiters comprise period characters or
slash characters.

16. The system of claim 14, wherein said processing means for constructing a
search key further comprises:

5 processing means for scanning an IP data packet to determine a first URI
6 element to be parsed;

processing means for initializing a URI pointer to a first character within said
first URI element; and

7 processing means for initializing said pattern search prefix to zero.

1 17. A computer program product for performing a pattern match search for a data
2 string having a plurality of characters separated by delimiters, said computer program
3 product comprising:

4 instruction means for defining a first category of characters as delimiters such
5 that all remaining characters are defined as non-delimiters;

6 *a!* instruction means for constructing a search key by:

7 generating a full match search increment comprising the binary representation
8 of a data string element, wherein said data string element comprises all non-delimiters
9 between a pair of said delimiters; and

10 concatenating a pattern search prefix to said full match search increment to
11 form said search key, wherein said pattern search prefix is a cumulative pattern search
12 result of each previous full match search increment;

13 instruction means for performing a full match search within a lookup table
14 utilizing said search key;

15 instruction means response to finding a matching pattern within said lookup
16 table for returning to said step of constructing a search key; and

17 instruction means responsive to not finding a matching pattern for utilizing the
18 previous full match search result to process said data string.

1 18. The computer program product of claim 17, further comprising instruction
2 means for pointing to a character within said data string prior to constructing a search
3 key.

1 19. The computer program product of claim 18, wherein said instruction means
2 for constructing a search key further comprises:

3 instruction means for evaluating said character to determine whether or not
4 said character is a delimiter;

5 instruction means responsive to said character being a delimiter for:

6 delivering a full match search increment into a search key register, wherein
7 said search increment comprises a binary representation of all non-delimiters between
8 said delimiter and an immediately preceding delimiter; and

9 concatenating said pattern search prefix to said search increment within said
10 search key element;

11 instruction means responsive to said character not being a delimiter for
12 appending a binary representation of said character to said search increment; and

13 instruction means for incrementing said pointer.

1 20. The computer program product of claim 17, further comprising instruction
2 means responsive to finding a matching pattern for updating said pattern search
3 prefix.

1 21. The computer program product of claim 71, wherein said instruction means
2 for performing a full match search further comprises:

3 instruction means for determining whether or not a full match for said search
4 key exists within said hash table by:

5 hashing said search key to produce a hash key result;

6 indexing a hash table utilizing said hash key result to find a matching stored
7 pattern; and

8 resolving collisions in said hash table utilizing a pattern search control block.

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2 22. The computer program product of claim 17, wherein said data string is a
3 Universal Resource Indicator address, and wherein said data string element is a URI
4 element.

5 23. The computer program product of claim 22, wherein said delimiters comprise
6 period characters or slash characters.

7 24. The computer program product of claim 22, wherein said instruction means
8 for constructing a search key further comprises:

3 instruction means for scanning an IP data packet to determine a first URI
4 element to be parsed;

5 instruction means for initializing a URI pointer to a first character within said
6 first URI element; and

7 instruction means for initializing said pattern search prefix to zero.